

Status of NASA Initiative
Electronic Health Record System
G. Wyckliffe Hoffler, MD and Duane A. Ratliff, MPH
Occupational Health Support Office, Dynamac

Presentation at
NASA 2004
Safety and Health Managers' Meeting
Cocoa Beach Hilton Hotel, Florida
4 March 2004

Origins and Objectives

NASA EHRS

- **OCHMO Vision:**

To develop and implement a NASA

Employee Longitudinal

Health Assessment Capability (ELHAC)

- **OCHMO Objectives:**

To improve and preserve the health and well-being of the NASA work force, and

To provide an objective basis for measurement of effects and outcomes of preventive and interventional health programs

Origins and Objectives

NASA EHRS

- Essential for a successful ELHAC

Design, develop, procure, install, and operate an

Electronic Health Records System (EHRS)

- Essentials for a fully functional EHRS

A compliant software vendor

Integrated hardware, software, and communications network

Knowledgeable, trained, and receptive user professionals

Management and resources support

Understanding the Task

NASA EHRS

Via Multiple Sources

- Relevant publications
- Discipline-specific conventions
- Commercial interests
- Current EHRS users
- Consultants
- Internal sources and support

Understanding the Task

NASA EHRS

- Tapped experience and expertise from MEDLINE, TEPR-MRI, IOM, AMIA, HIMSS
- Attended TEPR 2003, HIMSS 2004
- Visited VHA Ambulatory Facility, Viera, FL
- Reviewed vendor demonstrations
- Reviewed vendor responses to RFI (Oct 03)
- Visited NASA Center clinics
- Appointed dedicated Task Force
- Drafted technical content for NASA procurement

Results from Center Visits

NASA EHRS

- Informed professional staff about, and promoted the initiative
- Collected information on size of Center work force, extent of clinical services provided, numbers of professional personnel, computer work stations, health records, and on operational policies and procedures
- Sought professional and management “buy-in”

Results from Center Visits

NASA EHRS

• Number of CS Employees	19233
• Number of Contractor Employees	58400
• Active Health Records	75500
• Number of CS OH Personnel	36+
• Number of Contractor OH Personnel	271+
• Number of OH Work Stations	170
• Number of ODIN Maintained Seats	136

NB: Most systems use MS Windows (XX), are networked, operate with separate servers, have UPS (-5), backup daily (-4)

Shortcomings of Current System

Current NASA Paper Health Records

- Employee identification difficulties (Re: certification)
- Follow-up of missed appointments slow
- Redundant entry of same data
- Assessment results sometimes unavailable, misplaced, non-correlated
- Handwritten information illegible
- Poor communication with external providers, supervisors, managers, and **employees**

Shortcomings of Current System

Current NASA Paper Health Records

- Poor correlation with workplace hazards assessment, exposures, due to non-integrated data bases
- No alerts and reminders
- No links to complementary medical data
- No longitudinal evaluation of individual employees
- No longitudinal/epidemiological evaluation of work force population

Benefits of an EHRS

NASA EHRS

- Efficiencies in scheduling and coordinating health assessments
- Automatic data entry
- Elimination of redundant data entry
- Elimination/reduction of errors
- Alerts and reminders
- Enhanced employee (patient) – provider (user) encounter

Benefits of an EHRS

NASA EHRS

- Enhanced accuracy and quality of data
- Standardized terminology, data sets, and processing
- Summary of individual/population health
- Summary information for management
- Longitudinal mining of information for epidemiologic and research purposes
- Documented improvements in employee health
- Measured efficiency of resource use

Definition of EHRS

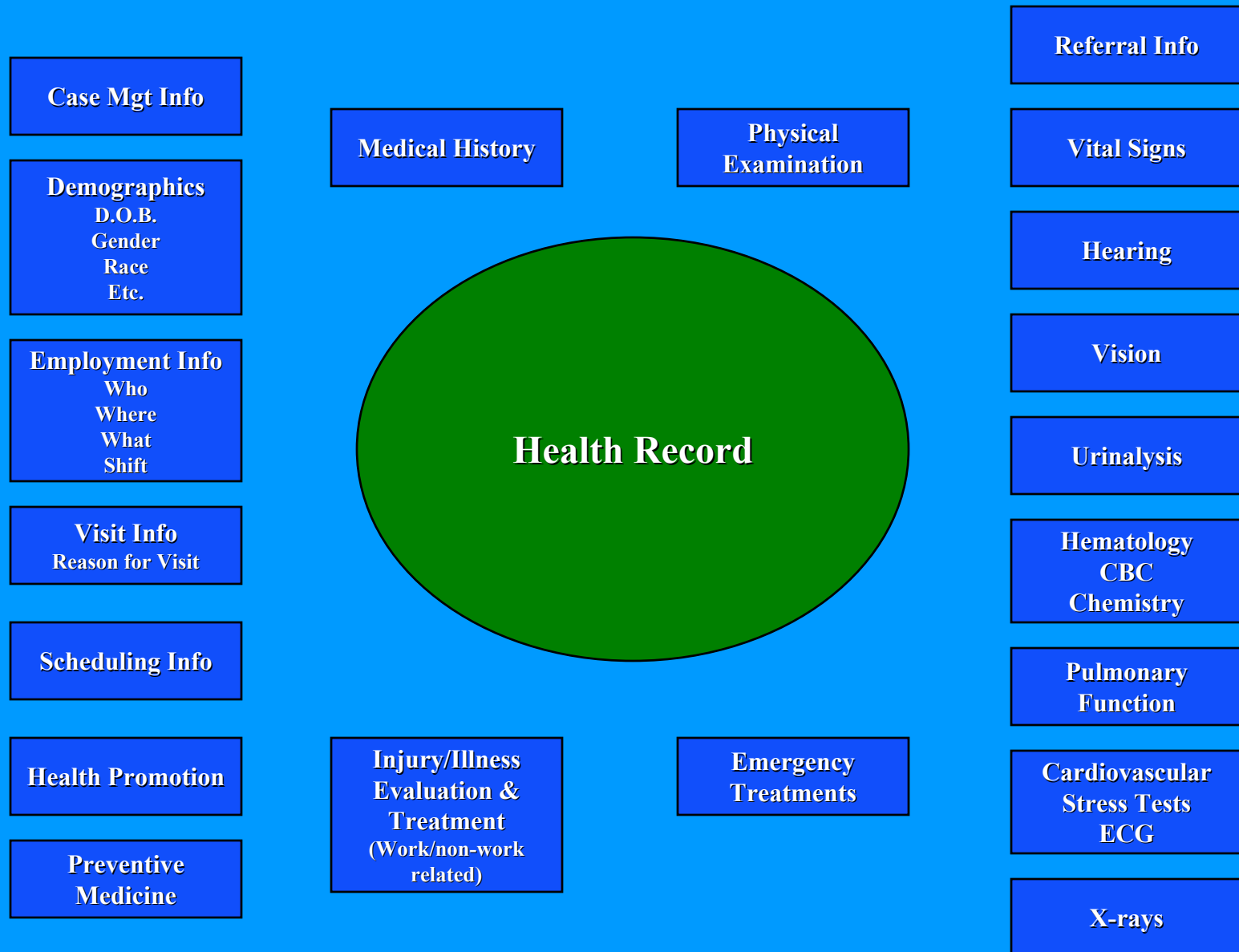
A “paperless” digital computer-based health information repository, with simplified, automated data entry and access, complete and accurate, secure but fully accessible to authorized users, providing real-time display of data for the patient provider, with alerts, reminders and links to other medical knowledge, and global epidemiologic retrieval of all or any subsets of stored data.

NASA EHRS

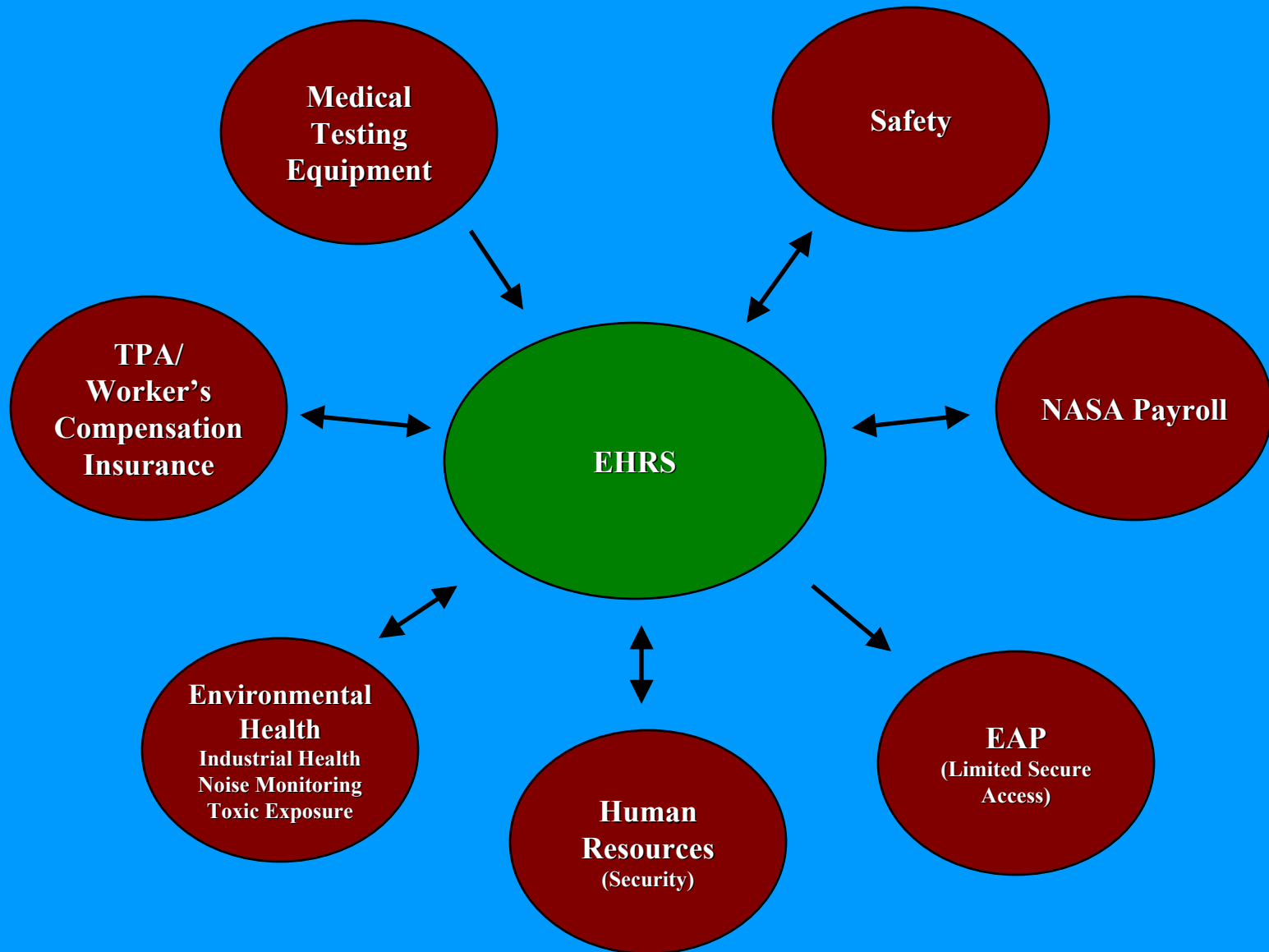
“The System”

- Requirements
 - Functional
 - Technical
 - Architecture
- Components
- Development
- Procurement
- Plausible Schedule and Resources

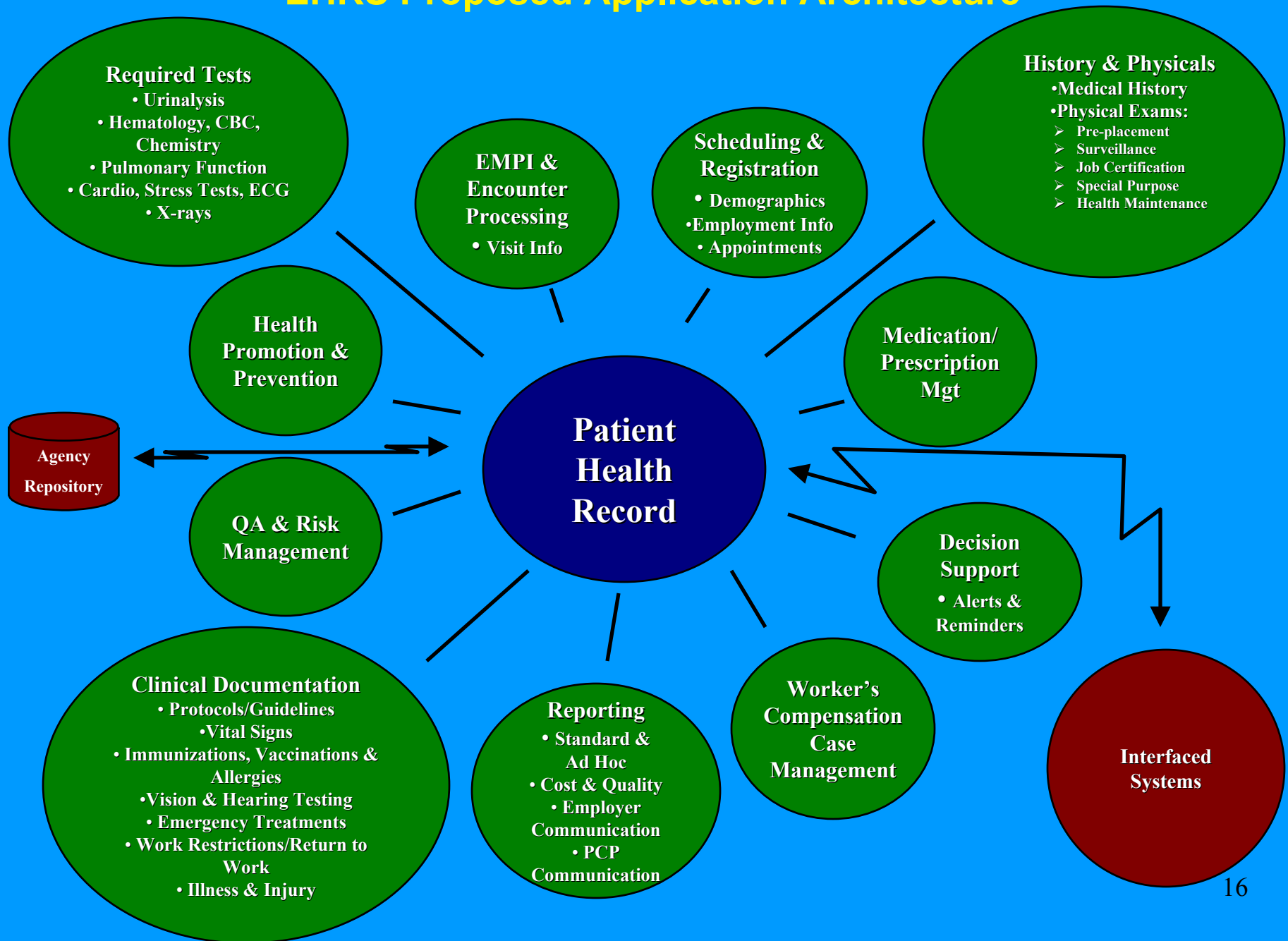
NASA Health Record



NASA Interfaces to EHRS



EHRs Proposed Application Architecture



Application Architecture

NASA EHRS

Assumptions:

- All functions/applications will be “built once,” implemented across Agency (ONE NASA, 14 sites)
- Center clinics will function as if autonomous
- Agency repository will access all Center data
- Application updates/modifications will be managed and distributed from a central IS location
- EMPI becomes an Agency-wide patient identifier (UUPIC)

NASA EHRS

System Development and Installation

- Selection of vendor with OH orientation
- Customization of COTS system to NASA environment and requirements
- Installation onto first NASA clinic hardware
- Training of first NASA clinic personnel
- Rollout with schedule to
- GO LIVE
- Shake down period
- Incorporate lessons learned into further installations

NASA EHRS

Issues and Concerns

- Selection of THE best vendor for contract
- No hiccups schedule for Center installations
- Adequate funding resources
- Operation and maintenance in perpetuity
- Dedicated support and training expertise
- Clinical and research utilization

The Future with a NASA EHRS

ELHAC

Employee Longitudinal Health Assessment Capability